2.3.4 Preliminary CO_2 Considerations for Dry and Wet FGD

The CO_2 footprint for a wet FGD is smaller than for a dry FGD. One reason is that capture of CO_2 on a unit equipped with a dry FGD requires adding a wet chimney since the gas has to be cooled before entering the CO_2 equipment. Also, since dry FGD cannot achieve SO_2 emissions as low as wet FGD, it requires a larger pre-scrubber/cooler to obtain SO_2 emissions below 10 ppm. Treatment to remove additional SO_2 would be needed. The CO_2 footprint primarily includes the pre-cooler and absorber, regenerator and compressors. However, even with the smaller footprint, a wet FGD produces more CO_2 than a dry FGD due to the chemical reactions with calcium carbonate ($CaCO_3$), though, the CO_2 produced from the presence of $CaCO_3$ is very minimal when compared with the CO_2 emissions from the combustion of coal. Also noteworthy is that lime is a product of limestone and even though dry FGD is not emitting CO_2, the kiln that is producing the lime (CaO) generates CO_2 from the off-gas driven off the stone and from the heat used to produce the lime in the kiln. The overall environmental balance, or carbon footprint, of CO_2 would likely be better for a wet FGD.

Auxiliary power requirements for a wet FGD are greater than for a dry FGD. The GGS dry FGD auxiliary power is approximately 11 MW per unit and the wet FGD requirement is approximately 16 MW per unit. Much of this is for the grinding of limestone. However, when using lime, the grinding is transferred to the kiln owner who grinds the stone at his works. This has the advantage of power that is *sold* rather than *used* from a commercial standpoint. Although wet FGD requires more auxiliary power than dry FGD, the source that would make up the lost generation could potentially be a combined cycle plant that would generate CO_2 from natural gas.

2.3.5 Permitting

Detailed permitting has been considered for both a wet and dry FGD retrofit. The detailed permitting requirements will be reviewed in Phase 2 preliminary engineering. Exhibit 2-1 summarizes the Phase 2 optimization activities.